

# **INSTRUCTIONAL TECHNOLOGY ACROSS THE CURRICULUM SAMPLE ACTIVITIES**

Michigan Department of Education  
with assistance from the  
East Grand Rapids Public Schools

## **ELEMENTARY OVERVIEW GRADES K - 5**

This proposed curriculum sets criteria for elementary schools. Students will be introduced to the keyboard as early as kindergarten. Skills students will need to master at each elementary grade level have been identified.

Keyboarding is not the only skill this curriculum addresses for the elementary student. K-5 students will have experiences in word processing at all elementary schools, as well as the introduction of desktop publishing to students in grades 3-5. Elementary schools will also incorporate technology into all areas of the curriculum. Students will take part in a project-oriented approach to technology. Projects will include book reviews, class newspapers, book publishing, research reports, introductory multimedia projects, and telecommunications with children in other schools via on-line resources.

Students in elementary school:

Having demonstrated knowledge in keyboarding, multi-media, word processing, desktop publishing, and online research through applications integrated into their subject matter classes.

## ELEMENTARY KEYBOARDING BENCHMARKS

GRADE	CONTENT KNOWLEDGE		APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF TEACHING/ LEARNING TIME
K	Familiar with keyboard	Exploration	Key recognition games and exercises	Self-directed learner	All year Weekly practice
1	Left/right hand position (use of yarn on keyboard to give sense of hand positions)	Introduction	Drill games and exercises from appropriate software	Effective communicator	All year Weekly practice
2	Home row hand position Key/finger accuracy 5 words per minute 50% accuracy	Introduction	Creative word processing exercises Specific language drills		All year Weekly practice 10 – 15 minutes per session
3	10 words per minute 80% accuracy Score printout in portfolio Minimum – cover all letter keys, shift, space bar and punctuation	Practice	Speed building exercises using content from reading and English		All year 10-15 minutes per session 2 times per week
4	15 words per minute 85% accuracy Score printout in portfolio Left/right hand position Home row hand position Correct key/finder	Review	Content area application		All year 10-15 minutes per session 2 times per week/6 weeks
5	20 words per minute 90% accuracy Score printout in portfolio	Demonstrate	Content area application		All year 5-10 minutes per session 2 times per week

## ELEMENTARY WORD PROCESSING BENCHMARKS

GRADE	CONTENT KNOWLEDGE		APPLICATION KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF TEACHING/ LEARNING TIME
K	Familiar with menu Compose, graphic, print	Introduction	Create picture and label with letters Sample in portfolio	Effective communicator	Process will occur year long as it is integrated into appropriate grade level curriculum
1	File menu: open, save and print Keys: delete, return, arrow Use mouse to insert curser	Introduction	Creative writing sample Sample in portfolio	Self-directed learner	
2	Review above File, menus, quit Font selection/size	Introduction	Collection of original poems (minimum of 2 per student) Sample in portfolio	Critical thinker	
3	File menu: new, open, close, save as (title of document), print preview and print Edit menu: undo Document menu: spelling and thesaurus Tab key Apple menu: chooser to select server or printer when networked	Introduction	Use the computer to <b>compose</b> , edit and print a personal letter Sample in portfolio	Creative produce	
4	Review above Access template Edit menu: cut, copy, paste, select all Justification and style Font type and size	Introduction	Use the computer to <b>compose</b> , edit and publish a creative writing story Sample in portfolio		
5	Review above Set margins and tabs Create folders and classify own documents	Mastery of introductory skills	Use the computer to <b>compose</b> , edit and publish a creative writing story Sample in portfolio		

## ELEMENTARY DESKTOP PUBLISHING BENCHMARKS

GRADE	CONTENT KNOWLEDGE		APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF 'TEACHING/ LEARNING TIME
2	Type text, choose graphic, edit and print	Exposure	Use simple programs combining text and graphics	Effective communicator	Process will occur year long as it is integrated into appropriate grade level curriculum
3	File menu: new, open, close, save as, print preview and print Edit menu: undo Reference menu: spelling and thesaurus Picture menu: add graphics Text menu: size	Introduction	Individual book review using report form Sample in portfolio	Critical thinker  Creative producer  Self-directed learner  Cooperative contributor	
4	Access template (when necessary) Text menu: font, alignment and style (Optional – border and color)	Introduction	Class newspaper (minimum of 2 entries per student) Sample in portfolio		
5	Review above Set margins and tabs	Demonstrate troductory skills	Individual project based on research topics, including electronic resources, from science, social studies or school theme Sample in portfolio		

## ELEMENTARY ONLINE TELECOMMUNICATIONS BENCHMARKS

GRADE	CONTENT KNOWLEDGE		APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF LEARNING TIME
4	Introduce on-line Access through signing on and off Learn acceptable use of communication Knowledge of individual software	Exploration	Pen pal communication Research	Effective communicator  Responsible citizen  Self-directed learner  Cooperative contributor	Process will occur year long as it is integrated into appropriate grade level curriculum
5	Review above	Exploration	Pen pal communication Research		

## ELEMENTARY MULTIMEDIA BENCHMARKS

GRADE	CONTENT KNOWLEDGE		APPLICATION OF KNOWLEDGE — EXAMPLES	Student Expectations	TEACHING/LEARNING TIME
2	Create text, image, and use existing sound for a multimedia presentation related to content area. (Examples: field trip, thematic units, class book, etc.)	Exploration	Research and integration with interdisciplinary units	Effective communicator  Responsible citizen	Process will occur year long as it is integrated into appropriate grade level curriculum
3	Create text, image, and record sound	Exploration	Research and integration with interdisciplinary units	Self-directed learner	
4	Organize and arrange information for a multimedia presentation Create and import images from a variety of sources Create and use sound from a variety of sources Knowledge of currently available software	Implementation	Research and integration with interdisciplinary units	Cooperative contributor	
5	Review above	Application	Research and integration with interdisciplinary units		

*Note: Teachers will observe students to ensure correct hand positions.*

These objectives are based on two computer labs per building.

## ELEMENTARY INTEGRATION INTO ALL CONTENT AREAS

Below are brief descriptions of how technology can be appropriately applied in specific curricular areas.

Language Arts	Mathematics	Social Studies	Science	World Languages
<p>Word processing, spell check, thesaurus and grammar checking software used in writing process.</p> <p>Database and telecommunications for research and communications.</p> <p>Organize, track, investigate and communicate progress in reading with databases and spreadsheets.</p> <p>Intervention, remediation, and reinforcement of language arts skills.</p> <p>Multimedia reports and productions with graphics, text and sound.</p> <p>Creation of timelines of events.</p> <p>Desktop publishing of documents, reports and other published materials.</p> <p>Video portfolios.</p>	<p>Database and spreadsheet software used in research.</p> <p>Intervention, remediation, and reinforcement of software for skill development.</p> <p>Simulation software used in problem solving.</p> <p>Logo programming for problem solving and simple geometry.</p> <p>Computer generated graphs.</p> <p>Database and telecommunications for research and communications.</p> <p>Instructional resources on videotape, videodisc and instructional television.</p>	<p>Software and online resources for map skills.</p> <p>CD-ROM and online resources for research.</p> <p>Multimedia software and hardware used in student reports and productions.</p> <p>Instructional resources on videotape, videodisc and instructional television.</p> <p>Still video and digitizing peripherals used in student projects.</p> <p>Desktop publishing of student projects and reports.</p> <p>Simulation software for problem solving.</p> <p>Individual and cooperative learning involving computer-based resources.</p>	<p>Database and telecommunications for research.</p> <p>Multimedia software and hardware use in student reports and productions.</p> <p>Computer-based laboratories for measurement/analysis.</p> <p>Optical technologies for research and analysis.</p> <p>Simulation software for problem solving.</p> <p>Instructional resources on videotape, videodisc and instructional television.</p> <p>Download and analyze data from weather satellite via internet resources.</p> <p>Review of basic skills and concepts using computer-based resources.</p>	<p>World language word processors for writing.</p> <p>Vocabulary review via computer.</p> <p>Introduction to languages via digitized voice.</p> <p>Digitized audio for language development.</p> <p>Telecommunications and database resources for research.</p>
Arts	Music	Physical Education	Special Education	Media Centers
<p>Computer drawing programs for creative expression.</p> <p>Design compositions involving various computer-based resources.</p> <p>Multimedia production and portfolios.</p> <p>Use of still and live video in projects.</p> <p>Animation software.</p> <p>Database and telecommunications for research.</p> <p>Art history and appreciation involving sources on video and CD-ROM.</p>	<p>Database and telecommunications for research in music appreciation and history.</p> <p>Resources on audio compact disc.</p> <p>Use of MIDI interface for music composition and performance.</p> <p>Creative music expression using multimedia resources.</p>	<p>Research in health and physical education involving computer-based resources.</p> <p>Database and telecommunications for research.</p> <p>Instructional resources on videotape, videodisc and instructional television.</p>	<p>CAI software for remediation.</p> <p>Assistive peripherals and software for special needs.</p> <p>Word processing.</p> <p>Intervention, remediation, and reinforcement of skills development.</p> <p>Instructional resources on videotape, videodisc and instructional television.</p> <p>Multimedia production.</p> <p>Use of laptop computers.</p>	<p>Computerized card catalog.</p> <p>Databases on CD-ROM.</p> <p>Telecommunications, including satellite television and local and world-wide online resources for research.</p> <p>Multiple computer stations for teacher/student use.</p> <p>Multimedia work stations.</p> <p>Central location of electronic resources.</p>



## **MIDDLE SCHOOL OVERVIEW GRADES 6TH - 8TH**

The Middle School Curriculum will build on the skills learned at the elementary level. Students will enter the middle school having met the elementary outcome of being able to type twenty words per minute at 90% accuracy. The middle school will integrate typing throughout the curriculum to reinforce these skills. Students will further their knowledge by completing courses in word processing, multimedia and database and spreadsheets throughout their middle school experience.

Across the curriculum in all content areas, middle school teachers will integrate the technological skills that students have learned in their elementary years. Teachers will integrate word processing skills into their courses at the sixth, seventh and eighth grade levels. The seventh grade courses will integrate multimedia, across the curriculum, wherever possible, exposing students to the more advanced features of multimedia as a communication tool. The eighth grade courses, across the curriculum, will integrate database and spreadsheet applications wherever possible. Therefore, students will leave the middle school having improved their typing and multimedia skills, and having mastered word processing, database and spreadsheet applications. They will also have a greater understanding of the World Wide Web as a pre-existing database and a research tool.

In addition, in Middle School, students will:

1. Analyze the interrelationship among technologies.
2. Evaluate the advancements in technology.
3. Identify and explain the resources needed to operate selected technological systems.
4. Analyze how computers are tools for information processing, communication expressions, decision- making, problem solving and control of other devices.
5. Identify and manipulate components used in integrated technological systems (e.g., computers, videodisks, CD-ROMs).
6. Describe and apply available information technologies, their functions and capabilities.
7. Analyze and evaluate the advantages and disadvantages arising from the application of a technological solution to a problem.
8. Comprehend the copyright, patent, and Freedom of Information laws as they relate to the use of technology.
9. Describe and evaluate the impact of technology on the home, school, community, and workplace.
10. Synthesize how technology impacts information access, analysis, organization, and utilization.

## MIDDLE SCHOOL COMPUTER BENCHMARKS

GRADE	CONTENT KNOWLEDGE	APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF TEACHING/ LEARNING TIME
6 Advanced Word Processing	Demonstrate the use of system commands or a computer program to control a technological system. Demonstrate such word processing skills as entering, storing, editing, formatting and revising text. Demonstrate the use of tabs and columns within a report.	Creative writing (ie. fractured fairy tales, poetry and stories) Spelling vocabulary exercises Letter writing – correct format – business and personal Essays – formatting (ie. page setup, headers, footers)		One semester Every other day Required course Designed to master advanced word processing
7 Multimedia	Multimedia used as a tool for organizing, arranging and storing information by creating buttons, fields, cards and stacks. Introduce technology media (computer, laser disc, telecommunications, still and live video, to effectively search, collect, process and store information. Apply technologies to interpret, analyze, synthesize and evaluate data information. Use information technologies as tools for creative expression and communication of ideas.	Integration units with academic core classes Family Tree Project Interdisciplinary Unit – Leadership Project		One semester Every other day Required course Designed to introduce the more advanced features of multimedia
8 Database and Spreadsheets	Demonstrate the more advanced features of database computer applications in hands-on problem solving. Introduce spreadsheet/computer applications and use learning activities to answer “what if” questions by manipulating numeric data formulas. Use pre-existing databases to collect research.	Baseball card database Personal address book Personal planner setup F.B.I. Most Wanted Database Personal Business Unit: <ul style="list-style-type: none"> <li>• spreadsheets on payroll</li> <li>• accounts receivable</li> <li>• accounts payable</li> <li>• database on inventory</li> </ul> Mail merge documents	Self-directed learners Critical thinkers Creative producers	All year Every other day Required course Designed to introduce spreadsheets and master databases

Once items have been mastered, academic course requirements will promote their continued use.

## MIDDLE SCHOOL ONLINE TELECOMMUNICATIONS BENCHMARKS

GRADE	CONTENT KNOWLEDGE	APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATONS	EXAMPLES OF' TEACHING/ LEARNING TIME
8 Communication Arts	<p><b>Research Strategies:</b>            To brainstorm possible topics and narrow the focus by asking questions which identify a "driving question."            To develop a search strategy using keywords which define the topic.            To learn strategies for online searching which aid in the management and movement of data.            To explain and use online resources that are appropriate for the learner and the topic.            To orgazine and analyze information in order to draw conclusions and implications based on the online investigation.            To utilize other print and non-print sources as necessary.            To produce a product using online sources combined with other resources.            To evaluate search results making a decision about accuracy of the data and reformulate the search if necessary.</p> <p><b>Online communications:</b>            To learn to evaluate a web site.            To become familiar with Internet procedure.            To practice electronic mail skills to communicate with the online community.            To learn and to model ethical, legal and responsible behavior in the online community.</p>	Career Research Mentorship Interdisciplinary Unit	Self-directed learners  Critical thinkers  Effective communicators  Creative producers  Involved citizens  Cooperative producers	Year-long unit in eighth grade

## MIDDLE SCHOOL INTEGRATION INTO ALL CONTENT AREAS

Below are brief descriptions of how technology can be appropriately applied in specific curricular areas.

Language Arts	Mathematics	Social Studies	Science
Word processing, spell check, thesaurus, and grammar checking software used in the writing process. Database and telecommunications for research. Outline/brainstorm software and CD-ROMs for writing. Multimedia projects with graphics, text and sound. Desktop publishing of newspaper. Desktop publishing of documents, reports and other published materials.	Spreadsheets to solve problems. Graphing calculators to discover concepts visually. Reinforce basic skills with Computer software. Simulation software used in problem solving. Computer generated graphs. Instructional resources on videotape, videodisc and instructional television.	Telecommunications to use online resources. Multimedia projects with graphics, text and sound. Databases on compact disk. Simulations. Spreadsheets to graph statistics. Still video and digitizing peripherals used in student projects. Desktop publishing of travel brochures and reports.	Database and telecommunications for research. Multimedia reports with graphics, text and sound. Download and analyze data from NASA and other related internet sites. Nationwide collaboration via telecommunications. Optical technologies for research and analysis. Simulation software for problem solving. Instructional resources on videotape, videodisc and instructional television.
Arts	Music	Physical Education	Life Management
Computer drawing programs for creative expression. Design compositions. Multimedia production using still and live video. Critique art work. Art history and appreciation involving sources on video and CD-ROM. Animation. Database and telecommunications for research.	Database and telecommunications for research. Compact disks on musical classics with analysis and history of writing. Create music. Develop music library.	Caloric analysis for physical fitness. Database for tracking of sports statistics. Computer interfaces to measure pulse in training. Database and telecommunications for research.	Database and telecommunications for research. Spreadsheets to graph and analyze nutrients in different food groups.
World Languages	Special Education	Technology Education	Media Centers
World language word processors for writing. Vocabulary review via computer. Introduction to languages via digitized voice. Compact disks with digitized speech. Telecommunications for research.	Computer software for remediation. Technology as tool to accomplish required objectives. Skill development and reinforcement. Use of laptop computers.	Principles of technology. Computer Aided Design (CAD). Computerized diagnostic devices. Multimedia reports with graphics, text and sound. Spreadsheet to graph and analyze data. Computer Aided Instruction (CAI) software for extension activities .	Computerized card catalog. Multiple databases on compact/video disk. Telecommunications lab for research and internet instruction. Multiple computer stations for teacher/student use. Multimedia work stations.

## **HIGH SCHOOL OVERVIEW GRADES 9-12**

Our goal is to incorporate technology into all areas of curriculum. Word processing, database manipulation, spreadsheet applications and basic programming will be integrated into student required courses. The use of on-line resources will be integrated into curricular areas for the exchange of ideas. Student elective courses will provide additional technological skills, including CAD/CAM, advanced programming, computerized accounting, and multimedia information.

The High School integrated technology curriculum may involve the following components:

- I. Technology integration into all content areas.
- II. Advanced knowledge in word processing, research, and multimedia through the study of language arts.
- III. Programming and spreadsheet applications through the study of mathematics.
- IV. Spreadsheet and database applications through the study of science.
- V. Telecommunications through the study of social studies.

Students will:

1. Produce word-processed documents.
2. Manipulate databases.
3. Understand and use on-line resources.
4. Publish documents on-line.
5. Discuss, and model ethical, legal, and responsible uses of technology.
6. Use spreadsheet applications.
7. Create multimedia projects.
8. Produce computer programs.
9. Manipulate spreadsheets.
10. Use content-specific software.

# HIGH SCHOOL LANGUAGE ARTS WORD PROCESSING BENCHMARKS

Reinforcement and application of previously introduced skills.

GRADE	CONTENT KNOWLEDGE	APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF TEACHING/ LEARNING TIME
9-10	<p>Well-written, visually pleasing documents using basic word processing skills.</p> <p>Reports created on a computer with title page, outline, text, works cited parenthetical referencing:</p> <ul style="list-style-type: none"> <li>•indenting</li> <li>•use of a variety of sizes and fonts</li> <li>•centering, setting margins</li> <li>•spell check</li> <li>•thesaurus</li> <li>•tabs, tab stops</li> <li>•pagination</li> <li>•spacing</li> </ul>	<p>Essays</p> <p>Themes</p> <p>Research reports</p> <p>Letters</p> <p>Timelines</p>	<p>Self-directed learner</p> <p>Effective communicator</p> <p>Creative producer</p>	Five hours in the first semester to outline expectations.
11-12	<p>Well-written, visually pleasing documents using basic word processing skills.</p> <p>Reports created on a computer with title page, outline, text, works cited parenthetical referencing.</p> <p>All of the above, plus:</p> <ul style="list-style-type: none"> <li>• moving blocks of text</li> <li>• deleting blocks of text</li> </ul>	<p>Theme writing</p> <p>Essays</p> <p>Peer editing</p> <p>Research reports</p>		Five hours in the first semester to outline expectations.

## HIGH SCHOOL LANGUAGE ARTS MULTIMEDIA BENCHMARKS

GRADE	CONTENT KNOWLEDGE	APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF TEACHING/ LEARNING TIME
9–12  Required Presentations	To compose, communicate, illustrate and illuminate their ideas. To research, interpret and communicate concepts and ideas. To compose meaningful images, video and sound. To demonstrate an understanding of various techniques used to create a multimedia presentation.	Possible integration (multimedia forms) Creative expression Multiple viewpoints	Self-directed learner  Critical thinker  Effective communicator  Creative producer  Cooperative contributor	Five hours each semester. Required.

# HIGH SCHOOL MATHEMATICS PROGRAMMING BENCHMARKS

Students will learn beginning programming language in all mathematics courses. All students with interest in fields of mathematics, engineering, or computer system uses will be encouraged to take advanced programming classes.

COURSE	CONTENT KNOWLEDGE		APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF TEACHING/ LEARNING TIME
ALGEBRA	Master the use of nested loops and counting techniques. Master the REM and GOTO statement.	Enter programs into the computer and use mathematics taught in Algebra to analyze the program.	Examine: order of operations, probability and relative frequency, intersection and union, volumes and areas of two dimensional objects, currency exchange rates, square roots and products, compound interest, weighted averages, and the quadratic formula.	Self-directed learner  Critical thinker  Effective communicator	One hour, five days each marking period. Required.
GEOMETRY	Master the use of the IF-THEN statement to make decisions about which procedures to follow.	Enter programs into the computer and use mathematics taught in Geometry to analyze the program.	Examine the surface area and volume of boxes, cones, pyramids and spheres. Study right triangle lengths. Find the ratio of the legs of right triangles.	Creative producer	One hour, five days each marking period. Required.
ADVANCED ALGEBRA	Master the use of the DEF FN command.	Enter programs into the computer and use mathematics taught in Advanced Algebra to analyze the program. Modify programs to achieve desired changes in the program's output. Write similar programs to solve mathematical problems.	Examine sequences both explicitly and recursively.	Cooperative contributor	One hour, five days each marking period. Required.
FUNCTIONS, STATISTICS and TRIG	Master the FOR-NEXT loop with advanced equations. Master the RND(1) function.	Analyze programs in terms of its mathematics. Design, write and run similar programs to solve mathematical problems.	Use tables of values to study the quadratic function. Study properties of composition of functions, exponential functions and trigonometric functions. Generate the elements of large sample spaces. Explore the random number generator. Evaluate geometric series and binomial probability distributions.		One hour, five days each marking period. Required.
PRECALCULUS, DISCRETE MATH	Master PRINT options to produce output in well organized charts.	Design, write and run programs to solve mathematical problems. Analyze when programming is an efficient way of problem solving.	Approximate the area under curves using Riemann sums with subintervals of equal width. Write a computer program which inputs two vectors and calculates their correlation coefficient. Write program to simulate the results of manufacturing problems using the binomial theorem. Evaluate dynamical systems.		One hour, five days each marking period. Required.



# HIGH SCHOOL MATHEMATICS SPREADSHEET OBJECTIVE

Reinforcement and application of previously introduced skills.

COURSE	CONTENT KNOWLEDGE		APPLICATION OF KNOWLEDGE EXAMPLES	STUDENTS EXPECTATIONS	EXAMPLES OF TEACHING/ LEARNING TIME
ALGEBRA	Demonstrate formatting of cells and editing and clearing of cells. Use formulas to perform calculations.	Enter and correct data in a spreadsheet. Format cells.	Calculate the sum and average of data. Evaluate multiplication and addition of fractions. Explore variable equations for the length, width and area of rectangular regions.	Self-directed learner  Critical thinker  Effective communicator  Creative producer  Cooperative contributor	One hour, five days each marking period Required.
GEOMETRY	Demonstrate formula writing with multiple cells. Display answers in a variety of ways. Demonstrate the CUT, COPY and PASTE functions.	Write formulas using many cells. Copy formulas using FILL DOWN.	Evaluate the measure of the angles of triangles, trapezoids, parallelograms, kites and rectangles. Given sides of angles, be able to calculate additional information about the polygon.		One hour, five days each marking period Required.
ADVANCED ALGEBRA	Demonstrate the PMT function to calculate the periodic payments for an installment loan when given the interest rate, number of payments to be made and the amount of the loan. Format cells for dollar amounts.	Produce an amortization table which displays how much interest and principal is paid on each payment of an installment loan.	Study compound interest and amortization techniques. Evaluate effects of time and interest on total expenses of purchased items.		One hour, five days each marking period Required.
FUNCTIONS, STATISTICS and TRIG	Demonstrate graphing functions for the spreadsheet.	Create pie charts, line graphs and bar charts to represent data.	Produce and print charts while studying the mean and standard deviation of data. Analyze data with the line of best fit. Use binomial probability distributions to create histograms of data.		One hour, five days each marking period. Required.
PRECALCULUS, DISCRETE MATH	Demonstrate the VLOOKUP function.	Create spreadsheets to solve complicated mathematical situations.	Compute average rates of change in functions. Use derivatives to identify properties of functions. Use tables of values to look up comparison information on functions.		One hour, five days each marking period. Required.

## HIGH SCHOOL SCIENCE SPREADSHEET BENCHMARKS

COURSE	CONTENT KNOWLEDGE	APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF TEACHING/ LEARNING TIME
PHYSICAL SCIENCE and CHEMISTRY	Learn to place actual lab data on a compatible spreadsheet, and use charting and presentation features to produce a presentation level document.	Laboratory assessments move from pencil and paper graphs to presentation printouts.	Critical thinker  Effective communicator  Creative producer	One hour, ten days in the first marking period to learn skills. After introduction, use skills to produce lab presentations during the remainder of the year.
PHYSICS and ANATOMY	Use of advanced graphing to produce graphical regressions.	Laboratory assessments advance to the higher level of statistical regression and curve fitting.		One hour, ten days in the first marking period to learn higher level spreadsheet skills. After introduction, use advanced skills to produce lab presentations during the remainder of the year.

## HIGH SCHOOL SCIENCE DATABASE BENCHMARKS

COURSE	CONTENT KNOWLEDGE	APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF TEACHING/ LEARNING TIME
GENERAL SCIENCE	Learn to navigate a university-based bulletin board to gain access to current data and information. Contribute to high school level data gathering services and extract compiled results.	Use of the Internet database to obtain research paper information. Use of a on-line database to contribute to research compilation.	Critical thinker  Involved citizen  Cooperative contributor	Nine hours in the first semester of the year to teach the use of the database search.
BIOLOGY	Learn to navigate a university-based bulletin board to gain access to current data and information. Contribute to high school level data gathering services and extract compiled results.	Use of the Internet database to obtain research paper information. Use of a on-line database to contribute to research compilation.		Nine hours in the first semester of the year to teach the use of the database search.

## HIGH SCHOOL SOCIAL STUDIES RESEARCH AND ONLINE TELECOMMUNICATIONS BENCHMARKS

Reinforcement and application of previously introduced skills.

COURSE	CONTENT KNOWLEDGE	APPLICATION OF KNOWLEDGE EXAMPLES	STUDENT EXPECTATIONS	EXAMPLES OF TEACHING/ LEARNING TIME
9 – 10	Search for information online. Publish documents online. Establish online conferences with remote sites. Demonstrate legal, ethical and responsible behaviors online. Use electronic mail. Demonstrate the ability to access and filter information resources.	<ul style="list-style-type: none"> <li>• Use of online resources to research.</li> <li>• Publish research documents to a server.</li> <li>• Submit homework through e-mail.</li> </ul>	Critical thinker  Effective communicator  Cooperative contributor  Creative producer  Self-directed learner  Involved citizen	Five hours each semester required.

## HIGH SCHOOL INTEGRATION INTO ALL CONTENT AREAS

Below are brief descriptions of how technology can be appropriately applied in specific curricular areas.

Language Arts	Mathematics	Social Studies	Science
Word processing, spell check, thesaurus, and grammar checking software used in writing process. Database and telecommunications for research. Outline/brainstorm software for writing. Multimedia projects with graphics, text and sound. Creation of timelines of events. Desktop publishing of newspaper and yearbook on computer. Enhance photographs. Video productions in Television Production class.	Spreadsheets to solve problems. Graphing programs to discover concepts visually. Reinforce basic skills with Computer software. Programming. Probability simulations. Special "word processors" with math symbols. Statistics software.	Atlas/map making. Telecommunications to use online resources. Multimedia projects with graphics, text and sound. Databases on compact disk. Simulations.	Database and telecommunications for research. Multimedia projects with graphics, text and sound. Computer probes for measurement/analysis. Optical technologies for research and analysis. Computer interface with lab instruments. Gravity, projectile motion and other simulation. Download and analyze data from weather satellite. Troubleshooting to solve problems. Nationwide collaboration via telecommunications.
Arts	Music	Physical Education	Business Education
Computer drawing with geometrical shapes or freehand. Design compositions. Critique art work. Scanning images and enhancing on computer. Animation. Enhance photography. Create multimedia portfolios. Database and telecommunications for research.	Database and telecommunications for research. Compact disks on musical classics with analysis and history of writing. Create music. MIDI interface to control music synthesizer. Develop music library. Software to help plan marching band formations/transitions. Digitize/analyze voices.	Body fat analysis for physical fitness. Database for tracking of sports statistics. Computer interfaces to measure pulse in training. Automated timers. Database and telecommunications for research.	Computerized record keeping and accounting. Advanced word processing/publishing. Advanced database and spreadsheet applications. Payroll, inventory management and other business simulations. Optical technologies for research and simulations.
Foreign Language	Special Education	Technology Education	Media Centers
Foreign language word processors for writing. Vocabulary review via computer. Introduction to languages via digitized voice. Compact disks with digitized speech. Telecommunications for research.	Computer software for remediation. Use technology as tool to accomplish required objectives.	Principles of technology. Robotics. Computer Aided Drafting/Computer Aided Machining (CAD/CAM). Computerized diagnostic devices. Career exploration software. Monitoring and feedback devices. Multimedia reports with graphics, text and sound.	Computerized card catalog. Multiple databases on compact/video disk. Telecommunications for research. Multiple computer stations for teacher/student use. Multimedia work stations.

## **SAMPLE BOARD POLICY – TECHNOLOGY CODE OF ETHICS**

### **INSTRUCTION**

#### **SAMPLE TECHNOLOGY CODE OF ETHICS**

The use of technology in the School District is an opportunity extended to students, faculty, and staff to enhance learning, productivity, and information processing. The computer hardware and software of the Public Schools shall be used solely for educational purposes specified by the Board of Education and staff of the Public Schools. The use of computer and related equipment and software for the purpose of sending or receiving information or images of a prurient nature is expressly prohibited.

#### **Policy Adopted:**

#### **RULES & REGULATIONS:**

#### **RIGHTS**

Students and staff:

- may use hardware and software which they have received permission to use;
- may access information from resources outside the school district; and
- may access the Internet to receive and send information.

#### **RESPONSIBILITIES**

Students and staff are responsible for:

- Utilizing information technology only for educational purposes, including, but not limited to the attainment of outcomes, goals, and objectives specified in curriculum documents of the district or otherwise delineated by teachers, administrators, and the Board of Education;
- Using hardware and software in a manner that enables its ongoing usage;
- Adhering to the rules, including, but not limited to, those posted in classrooms or computer labs or otherwise specified by school employees, for the use of hardware, software, labs, and networks in the school;
- Obtaining permission from a school official before bringing in their own software and using it on school equipment;
- Avoiding installing computer viruses or enabling the spread of such viruses on school equipment;
- Keeping hardware and software from being relocated, removed from school premises, or modified without permission of an administrator;

## **SAMPLE BOARD POLICY – TECHNOLOGY CODE OF ETHICS (Continued)**

- Maintaining the privacy of passwords and are prohibited from publishing or discussing passwords;
- All material received from sources outside the school district, including the Internet, under their user accounts and for accepting responsibility for keeping all pornographic material, inappropriate text files, or files dangerous to the integrity of the school's network, equipment, or software from entering the school;
- Adhering to the law and district policy pertaining to copyright and privacy rights in the use of hardware and software and in the transmission or copying of text or files;
- Avoiding using the technology for personal or private business, for product advertisement, or political lobbying; and
- Avoiding the malicious use of information technology to disrupt the use of technology by others, to harass or discriminate against others, or to infiltrate unauthorized computer systems.

### **DISCIPLINARY ACTION**

Students and staff violating any of these Rights and Responsibilities will face disciplinary action, which may include:

- Banning their using school information technology
- Making full financial restitution for any unauthorized expenses incurred or any damages caused;
- Attending training sessions; and
- Facing additional disciplinary action deemed appropriate in keeping with the disciplinary policies and guidelines of the school system up to dismissal from employment, litigation, or expulsion from school.

\* \* \* \* \*

Use of technology is a privilege extended to students and staff in order to enhance learning and exchange information. Each user of technology shall read the following *Technology Code of Ethics* statements and sign the *User's Responsibility Declaration* form prior to accessing and using district technology.

\*All students under the age of eighteen (18) are required to have a parent or guardian sign the user responsibility declaration before student access is granted.

### **USER'S RESPONSIBILITY DECLARATION**

I have read the attached Technology Code of Ethics and agree to be responsible for and abide by Privilege, Responsibilities, and Disciplinary Action as outlined above.